

OCTOBER 25, 2023

Qatar Foundation: EPC of SCADA System at Education City

City & Facility Management

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Qatar Foundation

Unlocking Human Potential



Qatar Foundation for Education, Science and Community Development (QF) was established in 1995 by:

- His Highness, The Father Emir, Sheikh Hamad Bin Khalifa Al Thani
- Her Highness, Sheikha Moza Bint Nasser Al Misnad (Chairperson)

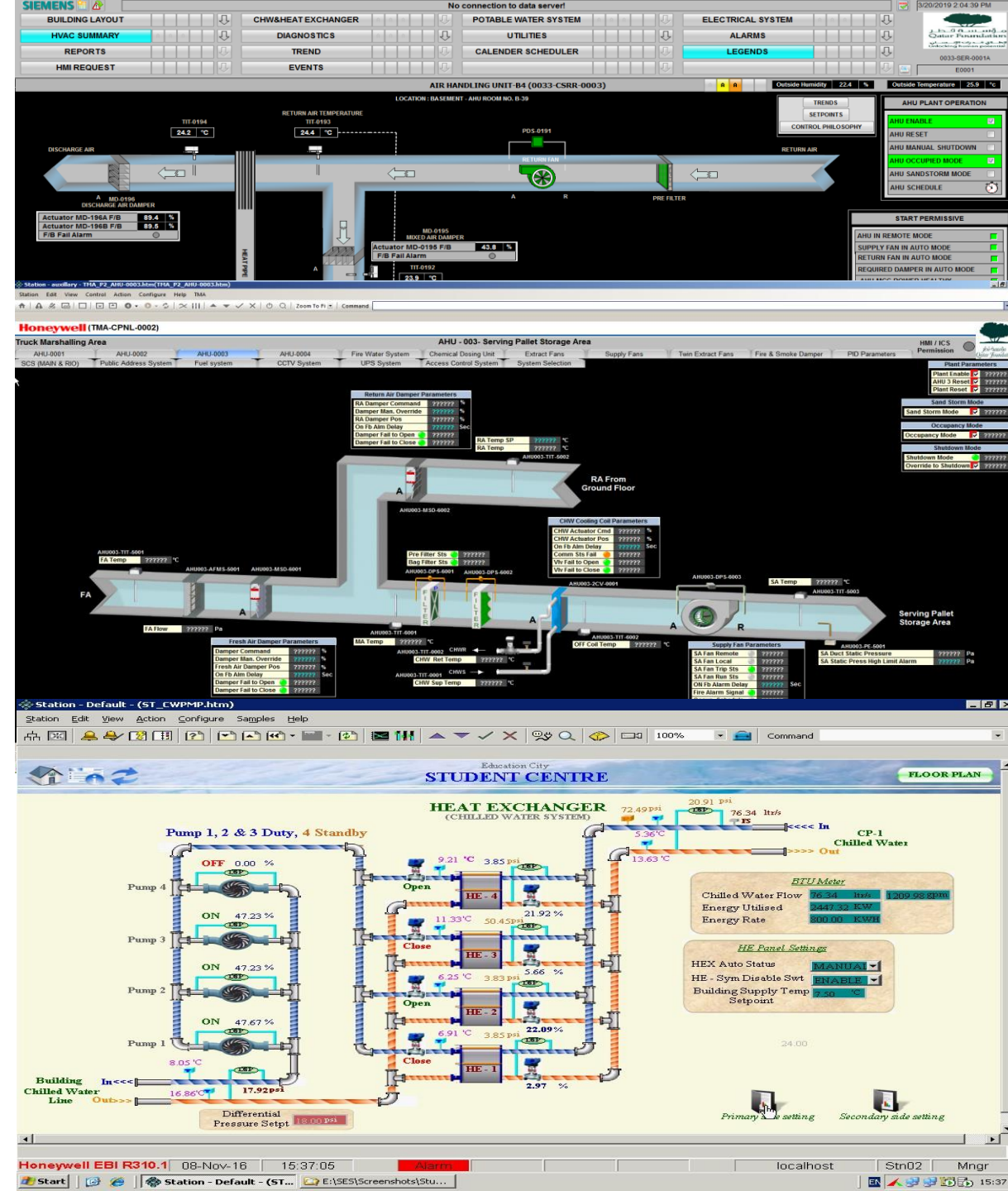
QF is a non-profit organization where centers and programs focused on education, research, innovation, and community development intertwine for the benefit of Qatar, and the world.



**12 SQUARE
KILOMETERS**

The challenge

- Many facilities have their local BMS from different manufacturers
- An OWS from every facility is added in the 2 Central Control Rooms (CCR) of Education City
- South Campus facilities were connected to CCR 1
- North Campus facilities were connected to CCR 2
- Individual OWS to monitor and control every facility in the CCR has made the CCR very cluttered
- Manual energy recording and reporting are followed
- Not able to determine cooling energy wastages due to improper scheduling and not having energy management in place
- A lot of manpower were needed to locally monitor and control every facility



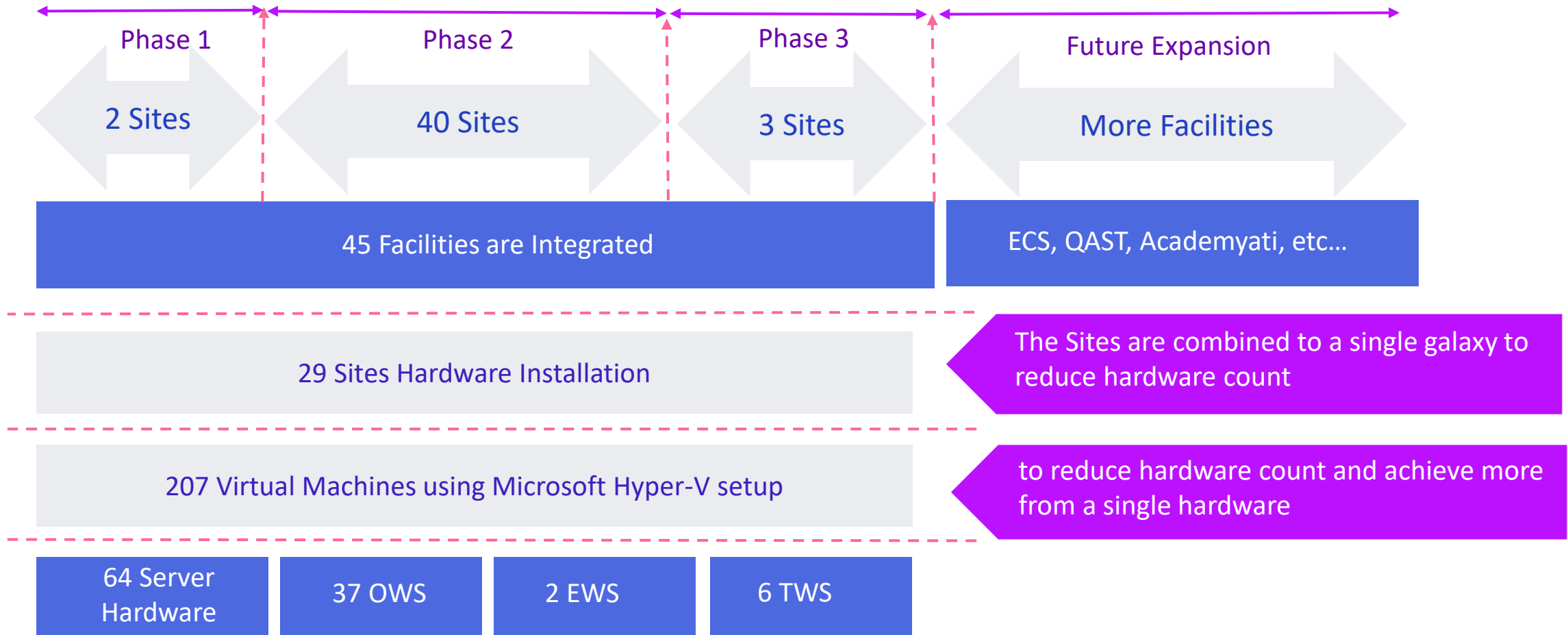
Various BMS at Education City Facilities

Facility Name	OEM	BMS
Central Plant 1	Schneider	EcoStruxure
Central Plant 1 Utility Tunnel		
North Utility Tunnel	Honeywell	EPKS
Central Plant 2	Honeywell	EBI
CP2 Utility Tunnel	Honeywell	EBI
TMA	Honeywell	EPKS
Central Plant 3	Honeywell	EPKS
Al Shaqab	Honeywell	EBI
CP4 utility tunnel	Honeywell	EBI
Central Plant 4	Honeywell	EBI
Central Plant 5	Siemens	WinCC
Central Plant 6	Honeywell	EPKS
South Utility Tunnel	Siemens	WinCC
Central Plant 7	Siemens	WinCC
Convention Centre (QNCC) & QNCC Extension	Honeywell	EBI
QNCC Carpark	Honeywell	EBI
QSTP - ITTC1	Honeywell	EBI
QSTP - ITTC2	Honeywell	EBI
College of Media and Communication (CMC)	Siemens	WinCC
School of Islamic Studies (QFIS)	Honeywell	EBI
Male Student Housing	Honeywell	EBI

Facility Name	OEM	BMS
Female Student Housing	Honeywell	EBI
AWSAJ		
Strategic Studies Centre (HQ -SSC)	Siemens	WinCC
QF Headquarters	Siemens	WinCC
Central Library/ QNL	Honeywell	EPKS
Student Centre	Honeywell	EBI
Oxygen Park Area	Siemens	WinCC
NEUCP	Siemens	WinCC
TAMU	Honeywell	EBI
Tech 4	Honeywell	EBI
Research & Development Complex	Siemens	WinCC
VCU	Honeywell	EBI
Western Green Spine	AVEVA	Plant SCADA (Citect)
West Car Park	Siemens	WinCC
Carousel	AVEVA	InTouch (Wonderware)
School of Foreign Service (GU)	Siemens	Desigo
Aljazeera Children	Schneider	EcoStruxure
College of Liberal Arts & Science (LAS)	Schneider	EcoStruxure
Ceremonial Court - Trend	Schneider	EcoStruxure
College of Medicine (WCMC)	Schneider	EcoStruxure
Carnegie Mellon University	Honeywell	EBI

Project overview

45 facilities are integrated to SCADA with independent local control & Centralized control from CCR



The solution - AVEVA components

Addressing the needs of centralized monitoring and control

- **Foundation**

- AVEVA Operations Control 2023
 - Redundancy
 - Scalability
 - Security

- **Visualization**

- AVEVA Intouch HMI
 - HMI software for control room
- AVEVA Intouch Access Anywhere
 - For remote monitoring from inside and outside QF
- Alarm management
- Trends

- **Tools for Operations**

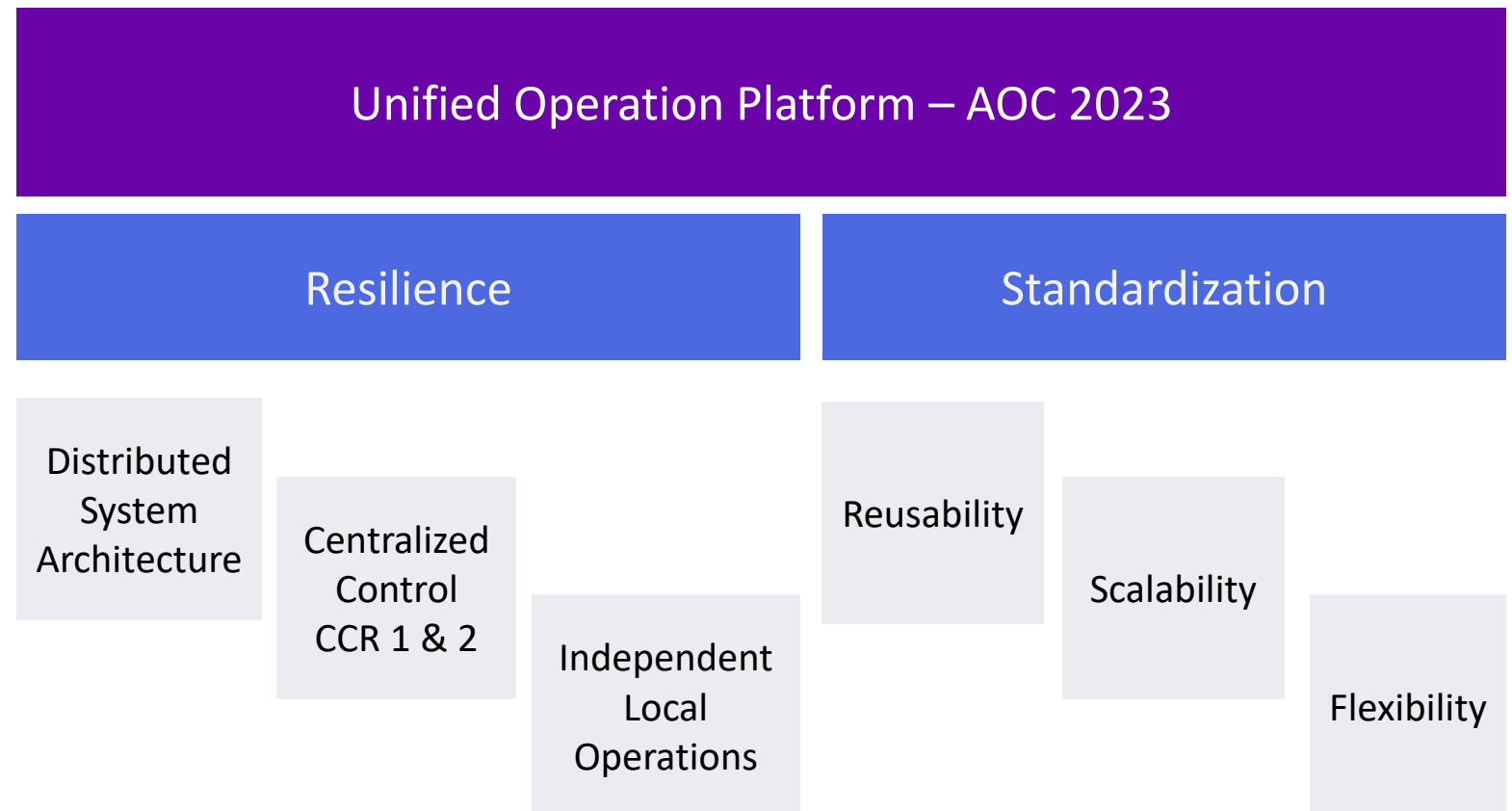
- AVEVA Historian
- Custom Reports using AVEVA Reports for Operations
- Automated Daily, Monthly Reports generation & delivery using email
- CAFM Integration for raising work request directly from AOC 2023
- Custom time-based scheduler

SCADA design guidelines and principles

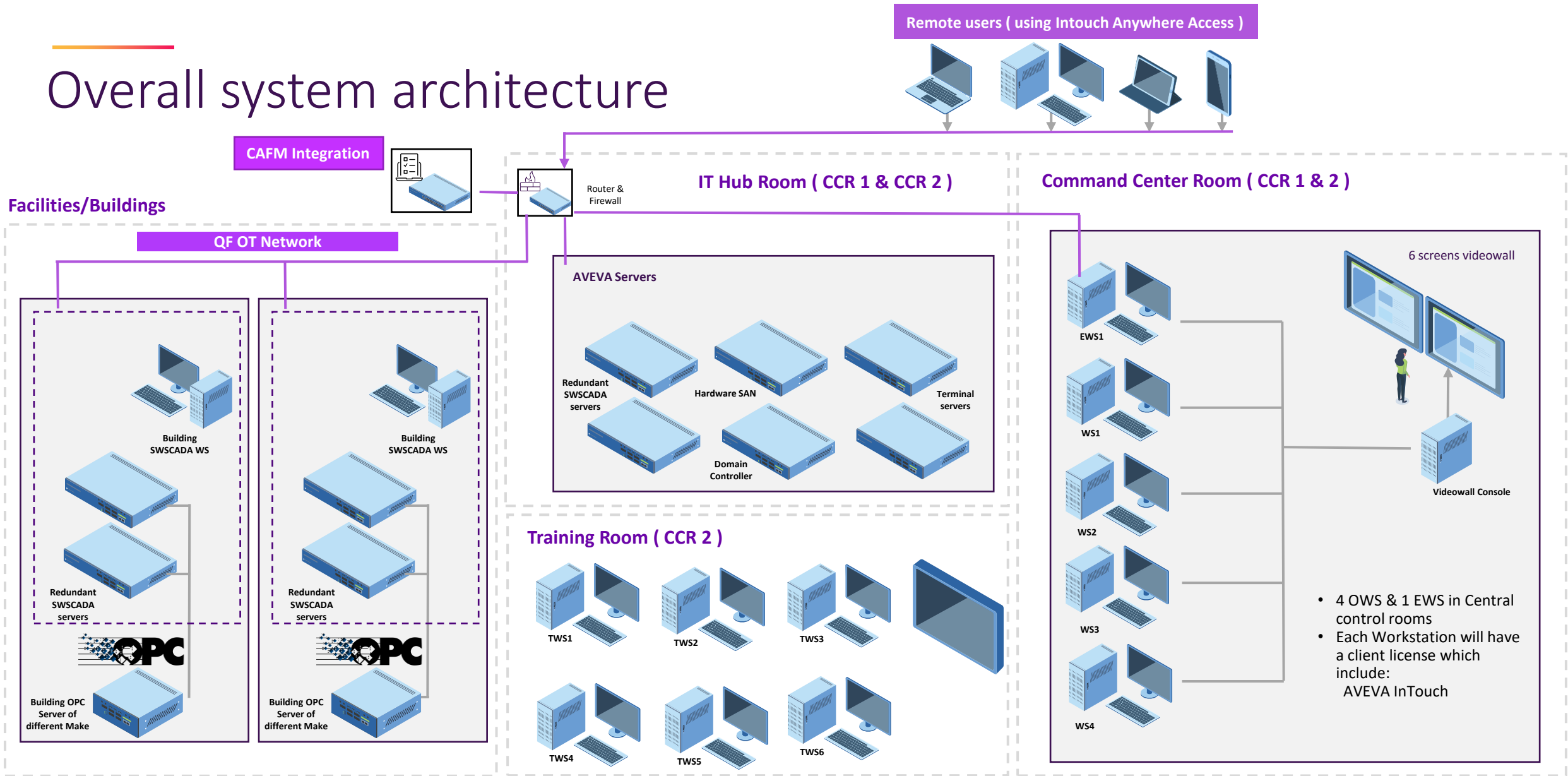
The Master Solution incorporates existing guidelines and standards from industry best practices, AVEVA Software development practices, and Qatar Foundation Standards to deliver the SCADA system.

Design Guidelines and Principles

- Centralized Control and Independent local operations
- Simplify and streamline
- Accessible by operators from remote
- High Availability
- Redundant solution
- Standardizing operations
- Minimizing energy usage through scheduling
- Scalable for future expansion



Overall system architecture



• 316,000 Data Points

• Upgraded to 500,000 licenses in total for future expansions

Training room

Trainings and Simulations using 6 TWS are performed in this room for the Operators / Supervisors

CP1 SCADA Application - Scheduler

Site-Wide Overview | North Campus | South Campus | Summary | Alarms | Trend | Scheduler | Documents | Systems | Print

20/02/2023 10:38:50

Scheduler | Zone | Time Period | Holiday/Weekend | Search

Title: Weekday_Schedule

Name: Weekday

Year: 2023 | Month: Mar

Day: 1-Wed 10-Fri 19-Sun 28-Tue 29-Wed 30-Thu 31-Fri

2-Thu 11-Sat 20-Mon 21-Tue 22-Wed 23-Thu

3-Fri 12-Sun 13-Mon 14-Tue 15-Wed 16-Thu

4-Sat 17-Fri 18-Sat 27-Mon

5-Sun 14-Tue 23-Thu

6-Mon 15-Wed 24-Fri

7-Tue 16-Thu 25-Sat

8-Wed 17-Fri 26-Sun

9-Thu 18-Sat 27-Mon

Buttons: Check All, UnCheck All, Monday, Check All Days, Add Selected, Add All Days Of Year-->, Sunday

Selected Days:

Name	Day
Weekday	09/03/2023
Weekday	09/03/2023
Weekday	12/03/2023
Weekday	13/03/2023
Weekday	19/03/2023
Weekday	20/03/2023
Weekday	26/03/2023
Weekday	27/03/2023

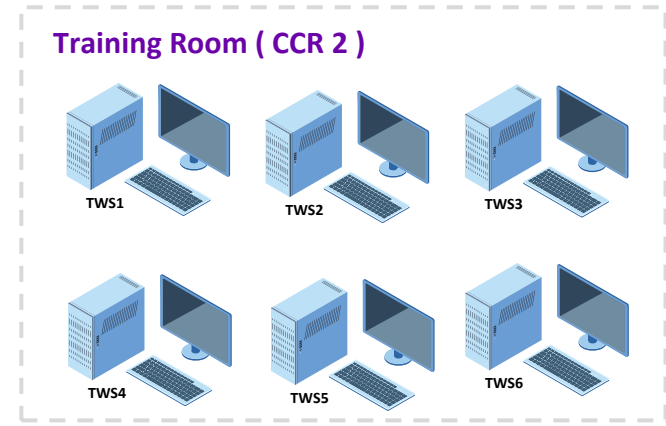
Buttons: Save, Cancel

Bottom Table:

TimeLCT	Tagname	Description	Type	Priority	State	Value	Limit	Class	Group	Node	Provider	UnAckDuratio	AlarmC
11:02/2023 11:54:42	CP7_FCU-7-5-RmTemp_Lo	CP7_FCU-7-5 First Floor Office 8 Room Temperature	Lo	251	UNACK_RTN	20.50888	20.5	VALUE	CP7 HVAC 1F	CP7GX101	Galaxy	000:00	
11:02/2023 11:54:56	CP7_FCU-7-11-RmTemp_Lo	CP7_FCU-7-11 First Floor Office 10 Room Temperature	Lo	251	UNACK_RTN	20.50888	20.5	VALUE	CP7 HVAC 1F	CP7GX101	Galaxy	000:00	
11:02/2023 07:32:33	CP7_FCU-7-10-RmTemp_Lo	CP7_FCU-7-10 First Floor Office Library Room Temperature	Lo	251	UNACK_RTN	20.50888	20.5	VALUE	CP7 HVAC 1F	CP7GX101	Galaxy	000:00	

VSCADA Ph-2 Training Group -3 - 20 Feb 2023 - Day-2

Lakshminarayana Rao Birakayala





Operator training

Training and simulation

- Operators were given hands-on training on SCADA system by AVEVA certified trainer
- Operators were given in-depth knowledge on SCADA philosophies, design principles , Architecture , communication , navigation , alarm management , scheduling , reports , trend analysis, CAFM integration etc.
- Training recordings are made available for new operators
- Process simulation were also conducted for hands on experience

AVEVA InTouch HMI - overview

The following table lists the hierarchy of the SCADA application

Style	Level	Description
Overview Map	0	Level 0 screen shows the Site Wide Overview gives a bird's eye view on Education City Masterplan where the facilities are mimicked as well as the total number of alarms associated with each facility
Facility Dashboard	1	Level 1 Building Dashboard shows KPIs for the entire facility , subsections includes CHW , HVAC , Electrical , Life safety etc.
Equipment Dashboard	2	Level 2 screens contain objects depicting KPIs for equipment in each facility / floor
Process Graphics	3	Level 3 screens typically provide detail on a specific piece of equipment, process, or area
Faceplate	4	Level 4 screens are pop-up style screens that are displayed when the user clicks on a component

Level 0 – Site Wide Overview

CP2 SCADA Application - Site Wide Overview LogOff qfoperator1 04/09/2023 11:41:32

Site-Wide Overview | North Campus | South Campus | Summary | Alarms | Trend | Scheduler | Documents | Systems | Print | ?

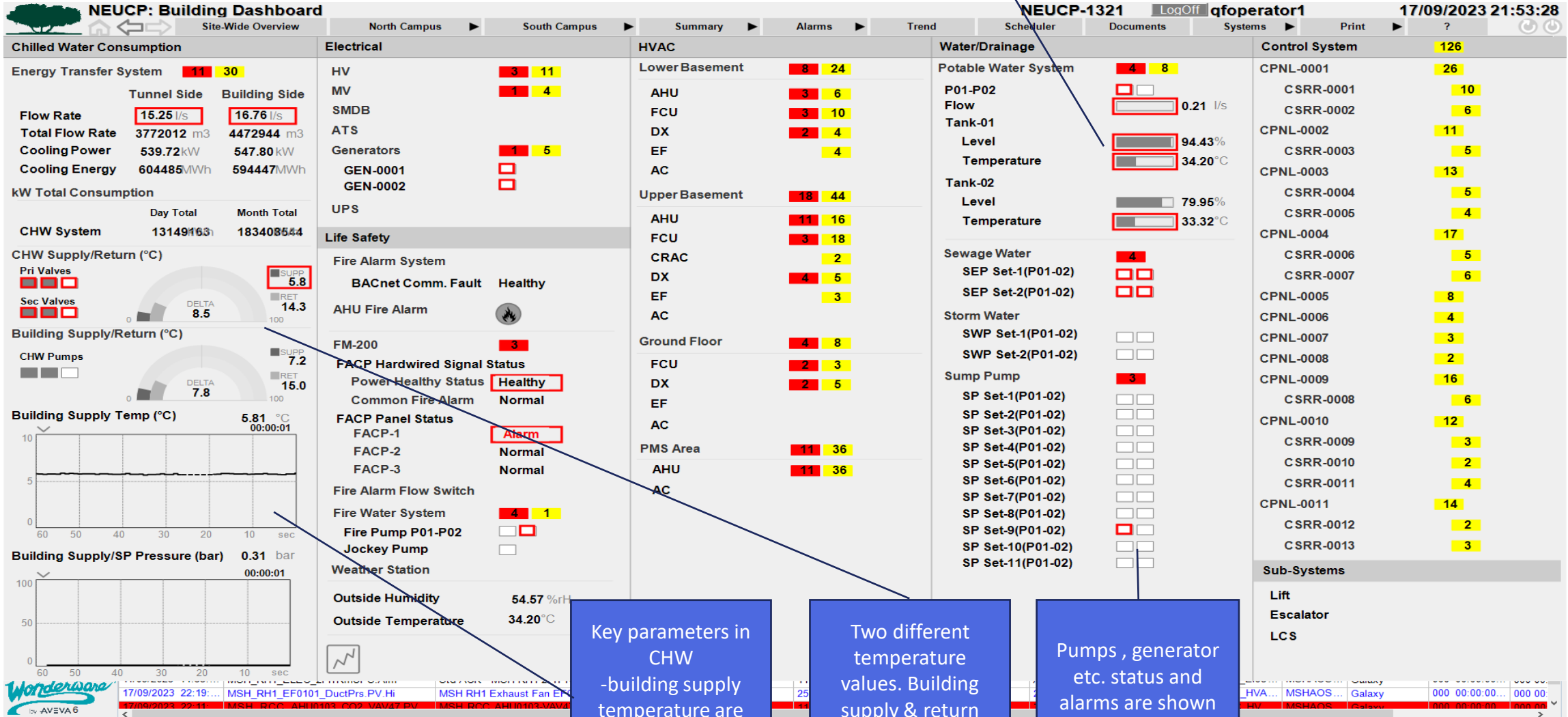
Display Building Names

1. Al Shaqab
2. Al Shaqab Hotel
3. HBKU Student Housing Complex (M)
4. HBKU Guest Residence
5. Central Plant 7
6. Oxygen Park
7. QFIS and Education City Mosque
8. Northwestern University in Qatar
9. Georgetown University in Qatar
10. Qatar National Library
11. Central Plant 1
12. HBKU Student Center
13. Temporary TV Studio
14. Ceremonial Court
15. Texas A&M University in Qatar
16. Carnegie Mellon University in Qatar
17. Well Cornell Medical College in Qatar
18. Green Spine
19. QF New Headquarters
20. MB 3
21. PC 1-4
22. SB 1-3
23. FB 1-3
24. Villas
25. Liberal Arts & Science Building
26. People Mover Visitor Centre
27. Virginia Commonwealth University in Qatar
28. Qatar Foundation Headquarters
29. HBKU Student Housing Complex (F)
30. Al Shaqab Club
31. Central Plant 4
32. Al Jazeera Children's Channel
33. Qatar Academy Junior School
34. Recreation Center
35. Qatar Academy Senior School
36. Western Green Spine
37. Awsaj Academy
38. Awsaj Recreation
39. Mathaf
40. PC 5-9
41. QF Offices
42. Qatar Academy Sindra
43. Educate a Child
44. Astad Site Offices
45. ECCH Lot 1
46. ECCH Lot 2
47. Lulu Express
48. ECCH Clubhouse
49. Qatar Green Building Council
50. Civil Defense
51. RDC
52. Reach Out to Asia
53. Central Plant 2
54. Central Plant 6
55. Central Plant 3
56. Qatar Science & Technology Park
57. Qatar National Convention Center
58. Sindra Medical & Research Center
59. ITTC-1
60. ITTC-2
61. Strategic Studies Center
62. MV1
63. MV3
64. Art Museum
65. Faculty & Staff Club
66. Tunnel System
67. North East Underground Car Park
68. West Car Park
69. Tech-4
70. TMA
71. Carousel
72. Central Plant 5
73. South East Car Park
74. Qatar Academy Expansion

Time	System	Message	Source	Priority	Device	Location	Category	Severity	Clear	Reset	Time	Time	Time	
16/08/2023 17:30:...	CP2AOS01B	EngineFailureAlarm	Std ACK -		System	111	ACK	true	true	USER	CP2AOS01B	CP2GX01	Galaxy	000 06:42:55...
16/08/2023 17:30:...	CP2AOS01A	Engine Redundancy Stan	Std ACK -		DSC	111	ACK	true	true	DSC	CP2AOS01A	CP2GX01	Galaxy	000 07:46:49

Level 1 – Building Dashboard

Water tank level, pressure is displayed using this bar indicator



Key parameters in CHW -building supply temperature are displayed in the form of trend.

Two different temperature values. Building supply & return and its difference (delta) is displayed.

Pumps, generator etc. status and alarms are shown using this symbol



Level 2 – Equipment Dashboard

CMC: HVAC Dashboard-BG CMC - 1181 LogOff qfoperator1 17/09/2023 21:44:11

Site-Wide Overview North Campus South Campus Summary Alarms Trend Scheduler Documents Systems Print ?

BG-Area B

VAV

BG-VAV-B03: Space Temp 20.08888°C, Eff SP 22.88888°C

AHU Label

Sup Air Temp

Rtn Air Temp

Duct Air Prs

Supply Fan 1 !!!

Supply Fan 2

Return Fan

AHU Key parameters

FCU Process Value & Feedback

BG-Area C1

VAV Process Value & Feedback

AHU Label

Sup Air Temp

Rtn Air Temp

Duct Air Prs

Supply Fan 1 !!!

Supply Fan 2

Return Fan

AHU Label

Sup Air Temp

Rtn Air Temp

Duct Air Prs

Supply Fan

Return Fan

AHU Label

Sup Air Temp

Rtn Air Temp

Duct Air Prs

Supply Fan 1 !!!

Supply Fan 2

Return Fan

FCU(BGC-05,06,07,08A,08B,09A,09B,10)

BG-Area C2

VAV

AHU Label

Sup Air Temp

Rtn Air Temp

Supply Fan

Return Fan

AHU-102

Sup Air Temp

Rtn Air Temp

Supply Fan 1 !!!

Supply Fan 2

Return Fan 53.06

AHU Label

Sup Air Temp

Rtn Air Temp

Duct Air Prs

Supply Fan 1 !!!

Supply Fan 2

Return Fan

AHU Label

Sup Air Temp 58

Rtn Air Temp 23.7

Supply Fan 100.00

Return Fan 100.00

BG-Area D

VAV / CAV

AHU Label

Sup Air Temp

Rtn Air Temp

Duct Air Prs

Supply Fan

Return Fan

AHU Label

Sup Air Temp

Rtn Air Temp

Duct Air Prs

Supply Fan 1 !!!

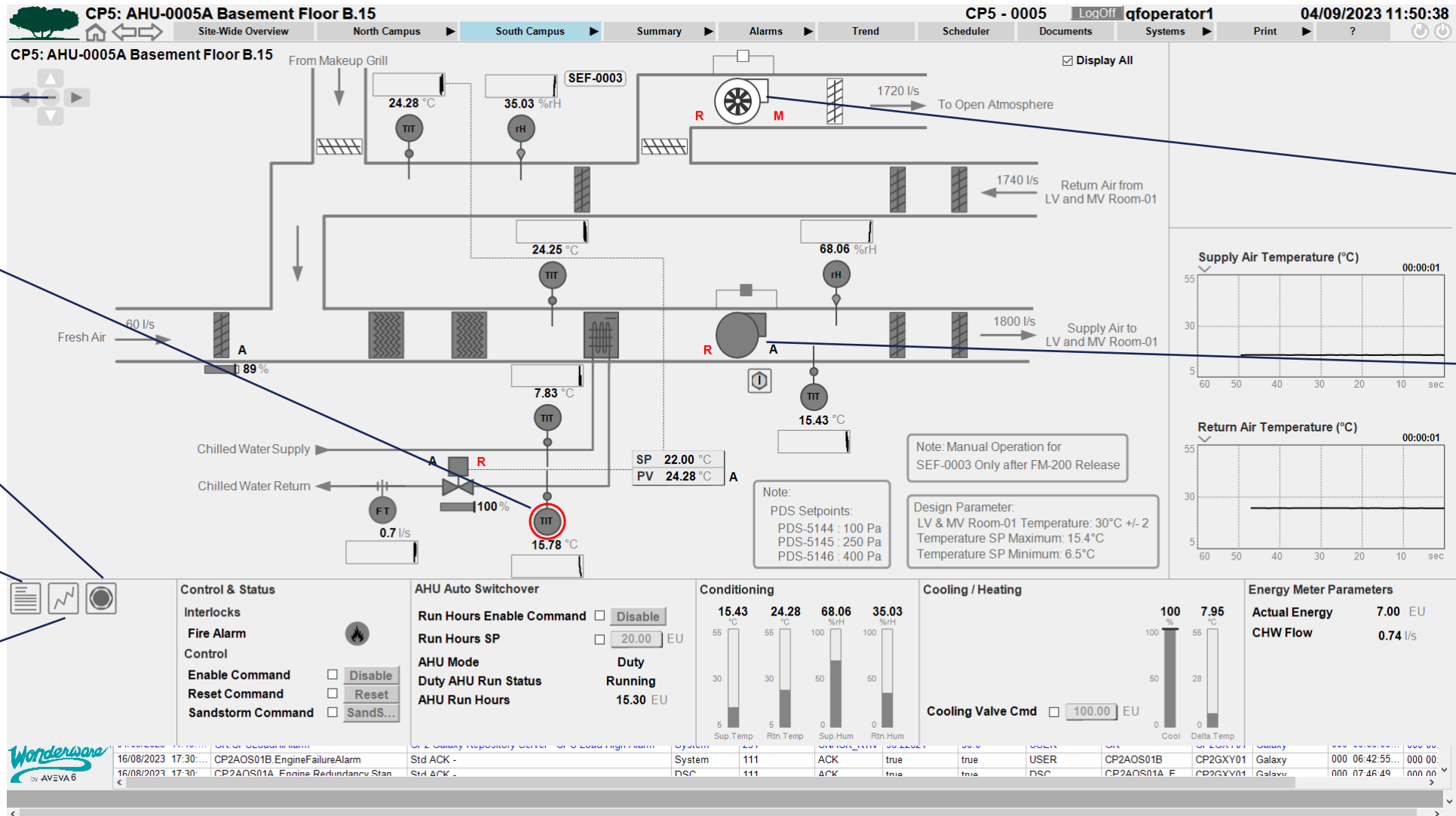
Supply Fan 2

Return Fan

FCU(BGD-1A,1B,15,18,19,20,21,23)

Wonderware by AVEVA 6	17/09/2023 22:12:11	MSH_APT2_LIFT0002.Alm	MSH Apt 2 Lobby Area Service Lift 2 - General Trouble...	DSC	251	UNACK	Alarm	Alarm	DSC	MSH_APT2_Su...	MSHAOS...	Galaxy	000 00:00:00...	000 00...
	17/09/2023 11:47:...	MSH_APT2_CHW_P0101.ETSP	Std ACK - MSH Apt 2 Chilled Water Pump 0101 - Fail t...	DSC	251	ACK	Alarm	Alarm	DSC	MSH_APT2_Co	MSHAOS	Galaxy	000 03:29:13	000 nn

Level 3 – Process Graphics



Star Navigation

If any alarm is active in the equipment, then a red border appears

Control Faceplate

Document Viewer

Page Trend

White color displays the equipment is not running

Grey color shows the equipment is running

Level 4 – Faceplate

CP5: AHU-0005A Basement Floor B.15

CP5 - 0005 LogOff qfoperator1 04/09/2023 11:51:13

Site-Wide Overview North Campus South Campus Summary Alarms Trend Scheduler Documents Systems Print ?

CP5: AHU-0005A Basement Floor B.15

From Makeup Grill

24.26 °C

35.03 %rH

SEF-0003

1720 l/s To Open Atmosphere

Return Air from LV and MV Room-01

Supply Air to LV and MV Room-01

Fresh Air 60 l/s

89%

Chilled Water Supply

Chilled Water Return

0.7 l/s

Temperature: 30°C +/- 2
maximum: 15.4°C
minimum: 6.5°C

Energy Meter Parameters

Actual Energy 6.89 EU

CHW Flow 0.73 l/s

100 7.96 °C

Cooling Valve Cmd 100.00 EU

100 55 28 0

Cool Delta.Temp

CP5GXY:CP5_AHU0005A_SupFan

CP5_AHU0005A_SupFan Run Status: Running

CP5 CPNL 0010 AHU 0005A Supply Fan

Control & Status Trend Alarm

Control	Status	Description	Command
Normal	Auto Command		<input type="checkbox"/> Auto
Normal	Manual Command		<input type="checkbox"/> Manual
Normal	Start Command		<input type="checkbox"/> Start
Normal	Stop Command		<input type="checkbox"/> Stop
Normal	Reset Command		<input type="checkbox"/> Reset

Status	Description	Status	Description
Running	Status	Yes	Operation Interlock
Auto	Auto/Manual Status	Yes	Operation Interlock in Auto
Remote	Local/Remote Status		

Statistics	Status	Total Run Hrs	Start Count	Last Run DT	Trip Count
Running	Running	250 04:10	211	03/09/2023 20:30:28	15

Run Hour Statistics

Run Hours Enable Command Disable

Run Hours SP 20.00 EU

AHU Mode Duty

Duty AHU Run Status Running

AHU Run Hours 15.31 EU

Sup.Temp 30 °C

Rtn.Temp 30 °C

Sup.Hum 50 %rH

Rtn.Hum 50 %rH

CAFM Button

Wonderware by AVEVA 6

Time	System	Event	System	Event	System	Event	User	System	System	System	System	System	System	System
16/08/2023 17:30:...	CP2AOS01B	EngineFailureAlarm	System	111	ACK	true	USER	CP2AOS01B	CP2GXY01	Galaxy	000 06:42:55...	000 00:		
16/08/2023 17:30:	CP2AOS01A	Engine Redundancy Stan	DSC	111	ACK	true	DSC	CP2AOS01A	CP2GXY01	Galaxy	000 07:46:49	000 00:		

Better Visibility - Floor Plan Screen

CP1 SCADA Application CMU:1F-N1N2 CMU-1171 LogOff qfoperator1 17/09/2023 21:32:52

Site-Wide Overview North Campus South Campus Summary Alarms Trend Scheduler Documents Systems Print ?

CMU:1F-N1N2 Display Serving Areas
 Display All

AHU-2001

Sup Air Temp 15.2

Rtn Air Temp 15.2

Duct Air Prs 235.4

Supply Fan 64.94

Return Fan 64.96

CO2 428.30 ppm

AHU-2031

Sup Air Temp 14.8

Rtn Air Temp 14.8

Duct Air Prs 242.4

Supply Fan 66.47

Return Fan 63.86

CO2 442.50 ppm

Time	Message	Device	Priority	Source	Destination	Severity	Alarm	Source	Destination	Priority	Time	Time	
17/09/2023 21:49:...	MSH_UB1_DX_3A Alm	Dual Air Conditioning Unit - General Alarm	DSC	251	UNACK_RTN	Normal	Alarm	DSC	MSH_UB1_HVAC	MSHAOS...	Galaxy	000 00:00:00...	000 00:00:00...
11/09/2023 16:23:11	MSH_SNMP_Client2 VMH01G1 ItemErr	Std ACK - The DDESuiteInkClient provides connectiv	DSC	500	ACK	true	true	DSC	MSH_SNMP_Cli	MSHAOS...	Galaxy	000 00:33:54	000 00:33:54

Better Visibility – Equipment Availability and Reliability

CP1 SCADA Application: Equipment Availability & Reliability LogOff QOperator1 27/09/2023 18:47:50

Site-Wide Overview North Campus South Campus Summary Alarms Trend Scheduler Documents Systems Print ?

Building	Description	Total Scheduled PM (hrs.)	Total Unscheduled Outage (hrs.)	Availability (%)	Reliability (%)	Accept Update	Last Update Date/Time	User
CP4-0004	CP4 Condenser Water System Cooling Tower 01	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Condenser Water System Cooling Tower 02	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Condenser Water System Cooling Tower 03	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Condenser Water System Cooling Tower 04	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Condenser Water System Cooling Tower 05	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Condenser Water System Cooling Tower 06	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Condenser Water System Cooling Tower 07	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Condenser Water System Cooling Tower 08	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Condenser Water System Cooling Tower 09	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Condenser Water System Cooling Tower 10	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Condenser Water System Cooling Tower 11	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Condenser Water System Cooling Tower 12	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 01	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 02	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 03	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 04	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 05	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 06	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 07	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 08	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 09	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 10	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 11	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Condenser Pump 12	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Chiller 02	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Chiller 03	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Chiller 04	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Chiller 05	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Chiller 06	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		
CP4-0004	CP4 Chilled Water System Chiller 07	0.00	0.00	100.00	100.00	<input checked="" type="checkbox"/>		

Expand All Collapse All

Reset Select All Clear All Sep 2023 Update Page 1 of 3

27/09/2023 19:07:...	MSH_APT2_LIFT0002 Alm	MSH Apt 2 Lobby Area Service Lift 2 - General Trouble...	DSC	251	UNACK_RTN	Normal	Alarm	DSC	MSH_APT2_Su...	MSHAOS...	Galaxy	000 00:00:00...	000 00:00:00...
27/09/2023 10:21:...	MSH_APT2_CHW_P0101 ETSP	Std ACK - MSH Apt 2 Chilled Water Pump 0101 - Fail t...	DSC	251	ACK	Alarm	Alarm	DSC	MSH_APT2_Co...	MSHAOS...	Galaxy	000 02:02:09...	000 02:02:09...

Better Visibility – Equipment Summary

CP1 SCADA Application: AHU Summary LogOff QOperator1 27/09/2023 18:49:53

Site-Wide Overview North Campus South Campus Summary Alarms Trend Scheduler Documents Systems Print ?

Building	Floor/Location	ID	Sup. Air Temp (°C)	Ret./Exh Air Temp (°C)	Supply Humidity (%Rh)	Supply Fan Status	Return Fan Status	Cooling Valve Feedback (%)	Supply Duct Pressure (psi)	Sup. Fan Filter Status	Exh. Fan Filter Status	Sup. Air Setpoint (°C)
CP6-0006	BF-P1-B25	AHU-0001	11.07	27.64	---	Running	---	100.00	---	Normal	---	---
CP6-0006	BF-P2-B15	AHU-0002	25.38	25.97	---	Running	---	0.00	---	Normal	---	---
CP6-0006	BF-P1-B8	AHU-0003	12.19	26.28	---	Running	---	100.00	---	Normal	---	---
CP6-0006	BF-P2-B32	AHU-0004	12.20	28.00	---	Running	---	100.00	---	Normal	---	---
CP6-0006	BF-P2-B15	AHU-0005A	15.35	23.92	---	Running	---	48.00	---	Normal	---	---
CP6-0006	BF-P2-B15	AHU-0005B	16.77	19.19	---	Stopped	---	0.00	---	Normal	---	---
CP6-0006	BF-P2-B32	AHU-0006A	21.22	25.70	---	Stopped	---	0.00	---	Normal	---	---
CP6-0006	BF-P2-B32	AHU-0006B	19.07	25.92	---	Running	---	16.00	---	Normal	---	---
CP6-0006	BF-P1-B30A	AHU-0009	13.23	26.27	---	Running	---	100.00	---	Normal	---	---
CP6-0006	GF-P4-G19	AHU-0007A	20.45	24.50	---	Stopped	---	0.00	---	Normal	---	---
CP6-0006	GF-P4-G19	AHU-0007B	20.15	25.62	---	Running	---	0.00	---	Normal	---	---
CP6-0006	GF-P3-G20	AHU-0008A	23.95	19.96	---	Stopped	---	0.00	---	Normal	---	---
CP6-0006	GF-P3-G20	AHU-0008B	23.26	26.18	---	Running	---	10.00	---	Normal	---	---
CP6-0006	GF-P4-G19	OAHU-0001	14.07	---	---	Running	---	29.00	---	Normal	---	14.00 °C
CP6-0006	LRF	AHU-0010B	18.88	19.97	---	Running	---	13.00	---	Normal	---	---
CP6-0006	LRF	AHU-0011	17.76	22.00	---	Running	---	17.00	---	Normal	---	---
CP6-0006	LRF	AHU-0012	14.49	22.03	---	Running	---	22.00	---	Normal	---	---
CP6-0006	LRF	AHU-0013	15.72	22.04	---	Running	---	29.00	---	Normal	---	---

Expand All Collapse All

Page 1 of 1

27/09/2023 19:11:...	MSH_APT2_LIFT0002.Alm	MSH Apt 2 Lobby Area Service Lift 2 - General Trouble...	DSC	251	UNACK_RTN	Normal	Alarm	DSC	MSH_APT2_Su...	MSHAOS...	Galaxy	000 00:00:00...	000 00:...
27/09/2023 10:21:...	MSH_APT2_CHW_P0101.ETSP	Std ACK - MSH Apt 2 Chilled Water Pump 0101 - Fail t...	DSC	251	ACK	Alarm	Alarm	DSC	MSH_APT2_Co...	MSHAOS...	Galaxy	000 02:02:09	000 00:...

Custom reporting and analysis

AVEVA Reports for Operations (Dream Report) are used as the Custom Report Tool

- Key Features
 - Leverages all archives from other solutions and applications such as SCADA, Historians
 - Integrates in one user-friendly environment all tools to easily create and generate automated Reports
 - Enables Print, Archive, Email and Reports Publishing over the web automatically
- Custom Automatic Reports configured currently are:
 - Central plants Daily Reports
 - Central Plants Monthly Reports
 - Flow Meter Reports
 - Alarms Report
 - Facilities Daily & Monthly Reports

Automatic Custom Reports for Cooling Energy Analysis

Qatar Foundation - Education City - Site Wide SCADA - CP2 Daily Report
CP5 Operations Report - DAILY



Report Period : 02/09/2023

CP5- Equipment Status

ID	01	02	03	04	05	06	07	08	09	10
Equipment	Chiller Train - 01		Chiller Train - 02		Chiller Train - 03		Chiller Train - 04		Chiller Train - 05	
Chiller Status	OFF	OFF	R	R	OFF	OFF	R	R	R	R
Chiller Last Run Date & Time	10/13/2022 03:17:53 AM	10/13/2022 03:17:54 AM	10/13/2022 10:59:28 AM	10/13/2022 10:55:13 AM	11/18/2022 03:00:54 AM	11/17/2022 04:11:58 PM	10/13/2022 03:17:54 AM	10/13/2022 03:17:54 AM	10/26/2022 09:44:27 AM	10/26/2022 09:41:28 AM
Chiller Load (%)	0	1	94	89	2	0	87	86	88	83
Cooling Towers Status	OFF	OFF	OFF	OFF	OFF	R	OFF	R	R	R
Cooling Towers (VFD-Speed %)	0	0	0	0	0	50	0	15	50	46
Condenser Pumps	OFF	OFF	OFF	R	R	R	OFF	OFF	OFF	OFF
Primary pumps Status	R	OFF	OFF	OFF	R	R	R	OFF	OFF	OFF
Secondary pumps Status	OFF	OFF	R	OFF	R	OFF	OFF	---	---	---
Secondary pumps (VFD-Speed %)	0	0	41	0	41	0	0	----	---	---
Tertiary pumps Status	OFF	R	---	---	---	---	---	---	---	---

A=Available; NA= Not Available;OFF = Not Running; R= Running; L=Local; REM = Remote; RM= Manual; RA=Auto; --- = Not Installed;N/A = Bad value

Qatar Foundation - Education City - Site Wide SCADA - CP2 Daily Report
CP5 Operations Report - DAILY

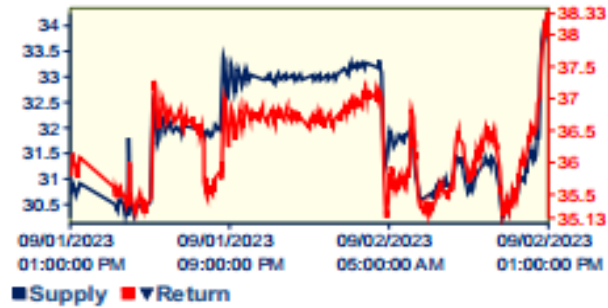


Report Period : 02/09/2023

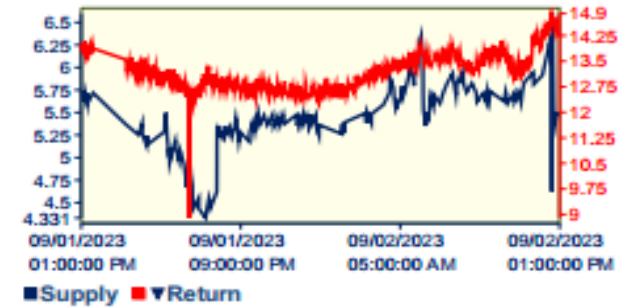
Parameters	Parameter s	Actual Values
Chilled Water System		
Supply To Load Temp. (°C)	5.5	8.4
Return From Load Temp.(°C)	14.5	15.2
Secondary Water Flow (gpm)	9874 gpm/Pump	691.90
Secondary D.P.-1 (Pa)	2.2	0.73
Secondary D.P.-2 (Pa)	2.2	0.2
Primary Water Flow (gpm)	5663 gpm/Pump	N/A
Condenser System		
Wet Bulb Temperature (°C)	-	24.3
Condenser Water Flow (gpm)	11983 gpm/Pump	N/A
Supply to Cooling Tower Temp (°C)	40.8	34.24
Return From Cooling Tower Temp (°C)	35	38.33
CT Make-Up Water Daily Consumption (m3)	-	1784042.62
CP5 Building Data		
Building CHW Tertiary DP (Pa)	0.9	2.05
Building CHW Total Flow (gpm)	835 gpm	53355426.85
CHW Bldg Sup/Rtn Temp. (°C)	6.5/15.4	8.4 / 15.2
CHW CP Sup/Rtn Temp. (°C)	5.5/14.4	5.5 / 14.2

* Readings are taken at 13:00 hrs

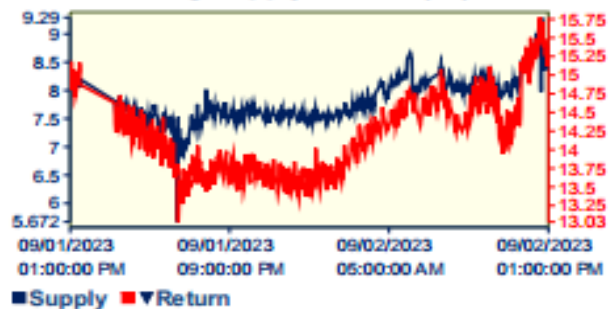
CP5- Cooling Tower Supply, Return (°C)



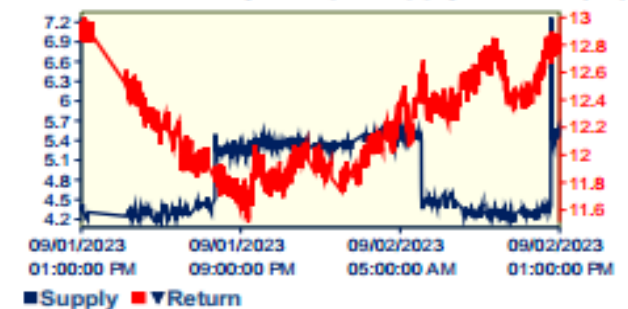
CP5- CP Supply, Return (°C)



CP5- Building Supply, Return (°C)



CP5- Secondary Pumps Supply, Return (°C)



Daily CHW Energy Calculation (kWh) 7702.20

Building Energy (TH) 296.35

District Energy (kWh) 309.32

Daily Tonnage Production (TH) 80773.12

Daily Cooling Energy Production (kWh) 284079.06

Make up Water Total Flow In (m3) 1782173.38

Make up Water Total Flow Out (m3) 1779762.88

NA= Not Available; Not Installed;N/A = Bad value

Qatar Foundation - Education City - Site Wide SCADA - CP2 Daily Report

CMC Chilled Water System Analysis - DAILY

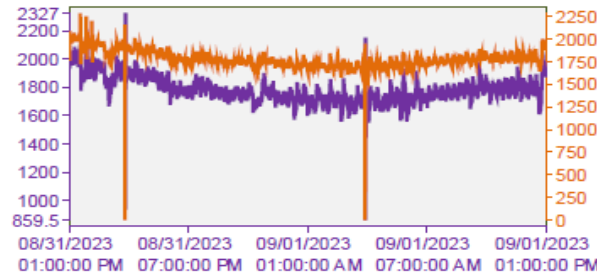


Report Period : 01/09/2023

Parameters	Design Values/Setpoint	Actual Values
Chilled Water System		
CP side CHW Supply Temp. (°C)	5.5 - 14.5	5.2
CP side CHW Return Temp. (°C)	5.5 - 14.5	13.9
Building side CHW Supply Temp. (°C)	7.5 - 15.6	7.35
Building side CHW Return Temp. (°C)	7.5 - 15.6	15.30
CP side Flow (l/s)	2796 - 2773 gpm	823.7
Building side Flow (l/s)	2796 - 2773 gpm	894.74
Building CHW Tertiary DP	-	---

* Readings are taken at 13:00 hrs

CMC- District and Building side Energy (kW)



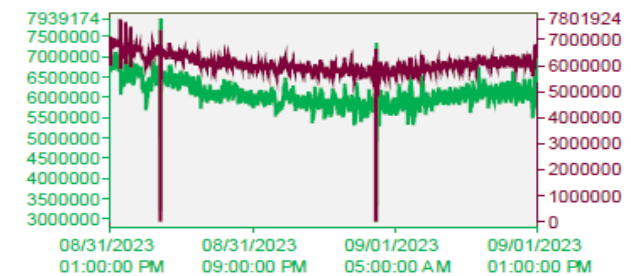
■ District Side Energy ▽ Building Side Energy

District Energy (kW) 1702.36

Building Energy (kW) 1686.44

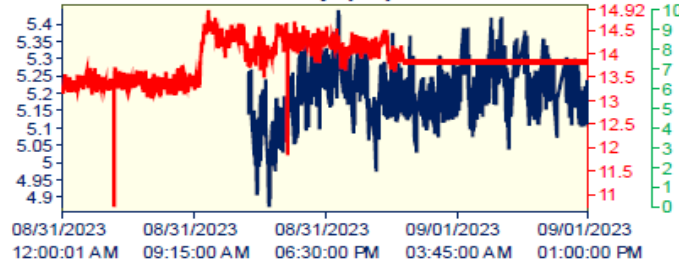
Daily CHW Energy Calculation (kWh) 44464.43

CMC- District and Building side Energy Rate (BTU/hr)



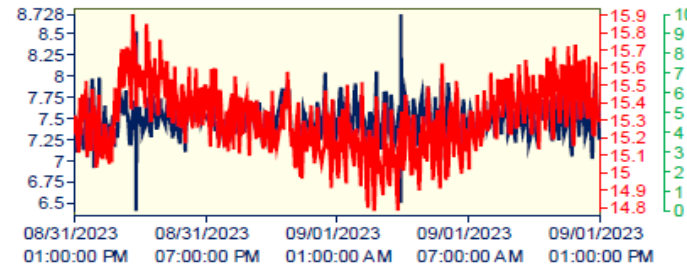
■ District side Energy Rate
 ▽ Building side Energy Rate

CMC - CP side Supply, Return & Delta Temp (°C)



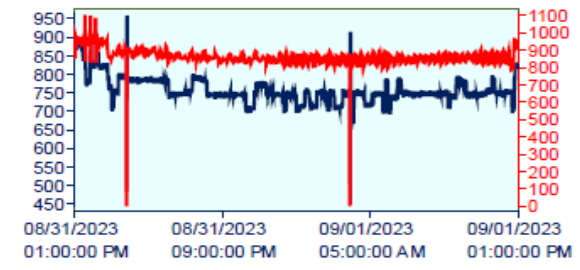
■ Supply ▽ Return ▽ Delta

CMC - Building side Supply, Return & Delta Temp (°C)



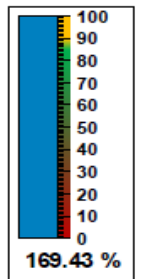
■ Supply ▽ Return ▽ Delta

CMC - District and Building side Flow (l/s)



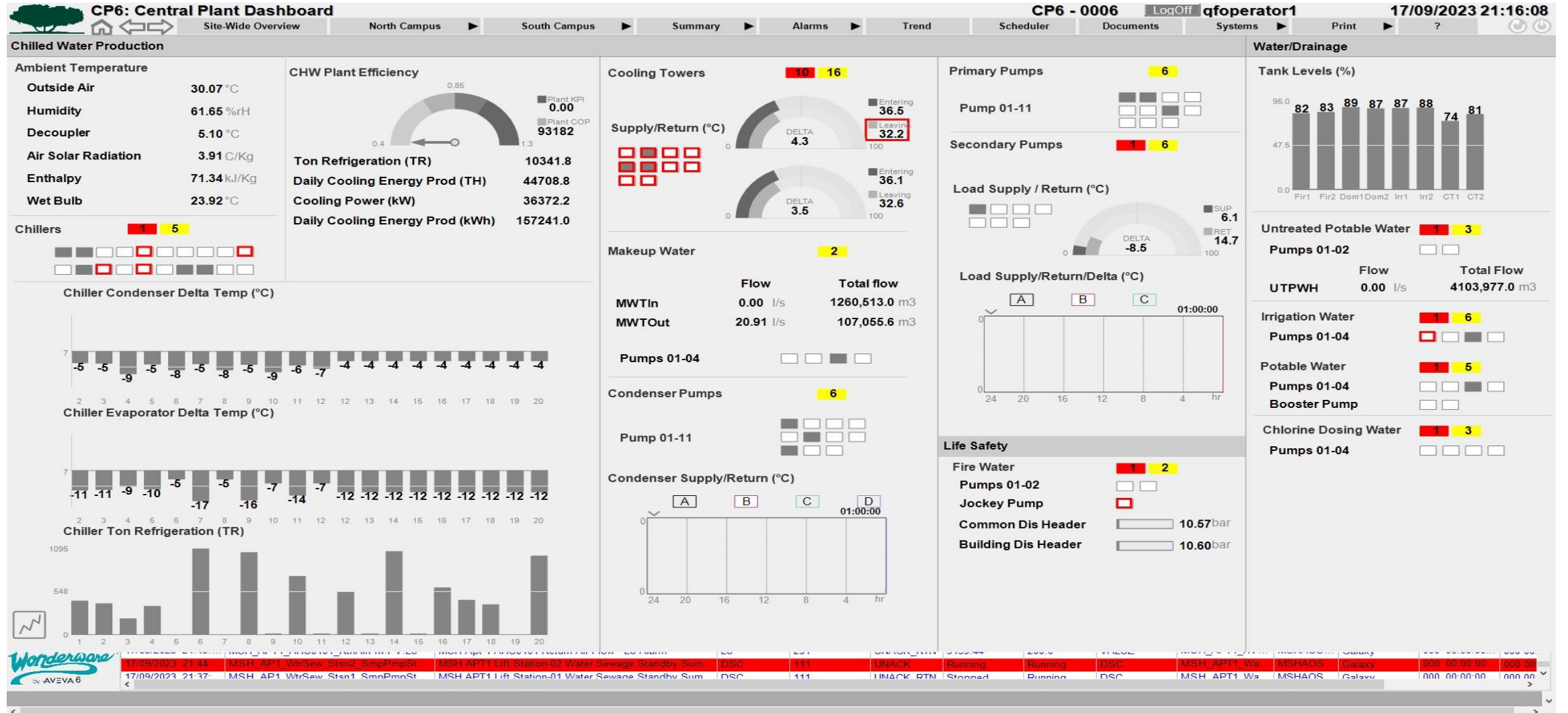
■ District side Supply Flow
 ▽ Building side Return Flow

Potable Water Tank
 Cap: 90 m3



NA= Not Available; Not Installed;N/A = Bad value

Central Plant Energy Production Dashboard



Central Plant Energy Consumption Dashboard and Trends

Chilled Water Consumption

Energy & Capacity

Building Energy 400.25 Ton-Hr
District Energy 410.62 EU

CHW Consumption

CHW System Day Total 7398 EU Month Total 23041EU

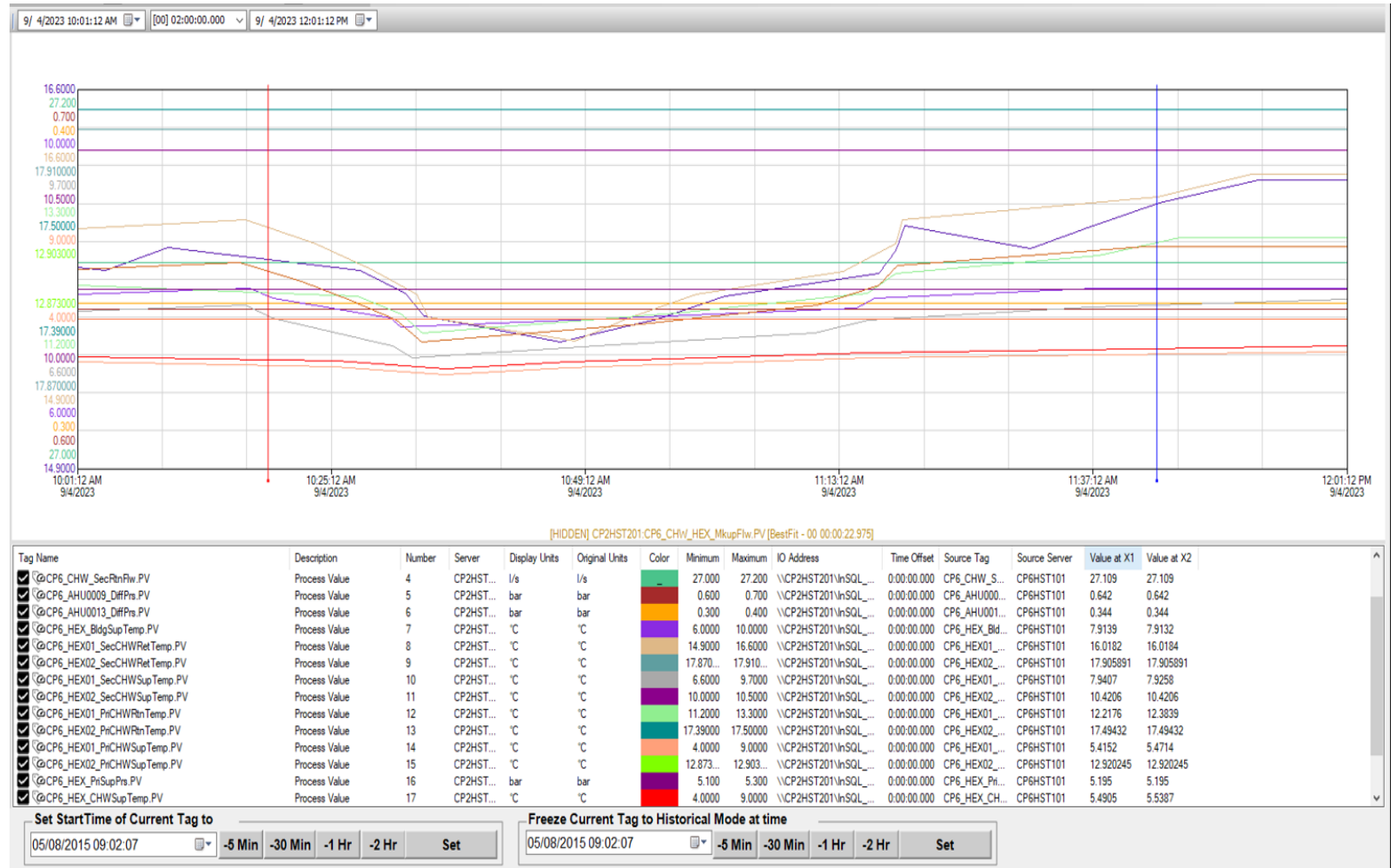
CP Supply/Return (°C)

Pri Valves
 Sup 4.7
 Rtn 13.3

Sec Valves
 Delta 8.6

Building Supply/Return (°C)

CHW Pumps
 Sup 6.9
 Rtn 14.9
Delta 8.0



Remote Control of XL10 LON Controllers Network Setpoint from AOC 2023 – Challenge

- Use Network set point checkbox is utilized to allow the operator to input a set point from the Remote OWS when the checkbox is checked in the Local BMS
- The factory setting of this checkbox was disabled to prevent the Remote Operator from controlling the equipment
- The checkbox OPC I/O cannot be exposed for VAV, CAV, FCUs that are implemented using XL10 LON controllers in 6 facilities
- This check box could be accessed from the local BMS (EBI - Honeywell) only to change the controller settings

The top screenshot shows the 'Lon VAV Point' configuration page for 'CP4_VAV05App'. The 'Setpoint configuration' section has the 'Use network setpoint' checkbox checked, and the setpoint is 327.7 degrees C. The 'Ideal condition when system is running in Auto' section shows heating and cooling setpoints.

The bottom screenshot shows the 'Control & Status' page for 'CP4_VAV0005'. The 'Control' section has the 'Use Net Setpoint' checkbox checked, and the setpoint is 23.00 degrees C. The 'Status' section shows the current room temperature is 22.40 degrees C.

Remote Control of XL10 LON Controllers Network Setpoint from AOC 2023 – Challenge Resolution

- We have implemented scripts for VAV, CAV, FCU LONworks points in Local BMS to enable navigation to Instruction display screen whenever the check box is checked from AOC 2023 VAV/CAV/FCU faceplates
- Each VAV/CAV/FCU associated display points were modified for navigation to faceplates
- By doing these script changes in local BMS we were able to control Network Setpoints for VAV/CAV/FCU's equipped with LONworks XL10 controllers
- We have achieved considerable cost savings to Qatar Foundation

The top screenshot shows the 'Control & Status' tab for CP4_VAV0005. The 'Command' field is set to 18.00 °C, and a status message indicates 'Setpoint changed to 18°C'. The 'Status' section shows 'Effective Setpoint' at 22.85 °C, 'Damper Position' at 38.60 %, and 'Duct Air Flow' at 11.00 l/sec.

The bottom screenshot shows the 'SETPOINTS' tab for CP4_VAV05App. The 'Use network setpoint' checkbox is checked, and the 'Cooling setpoint' is set to 18.0 degrees C. A status message indicates 'Setpoint changed from sitewide SCADA and reflecting on EBI'. The 'Mode' section shows 'Occupied' at 23.0 degrees Celsius, 'Standby' at 23.0 degrees Celsius, and 'Unoccupied' at 23.0 degrees Celsius. The 'Heating setpoint' is set to 19.0 d, 12.0 d, and 11.0 d.

Water Meter Management

SWSCADA Flow Meter Report(Daily) - ALSQB

Report Period : 25/08/2023 12:59 PM To 26/08/2023 01:00 PM



DAILY FLOW (l/s)

Item Name	Min	Max	Average
SSUT_ALSQB_FM1_FR.PV	0.93	17.86	8.51
SSUT_ALSQB_FM2_FR.PV	-0.95	91.23	26.57

DAILY TOTAL (m3)

Item Name	Total
SSUT_ALSQB_FM1_FR.Tot	733.47
SSUT_ALSQB_FM2_FR.Tot	2287.72

HOURLY TOTAL (m3)

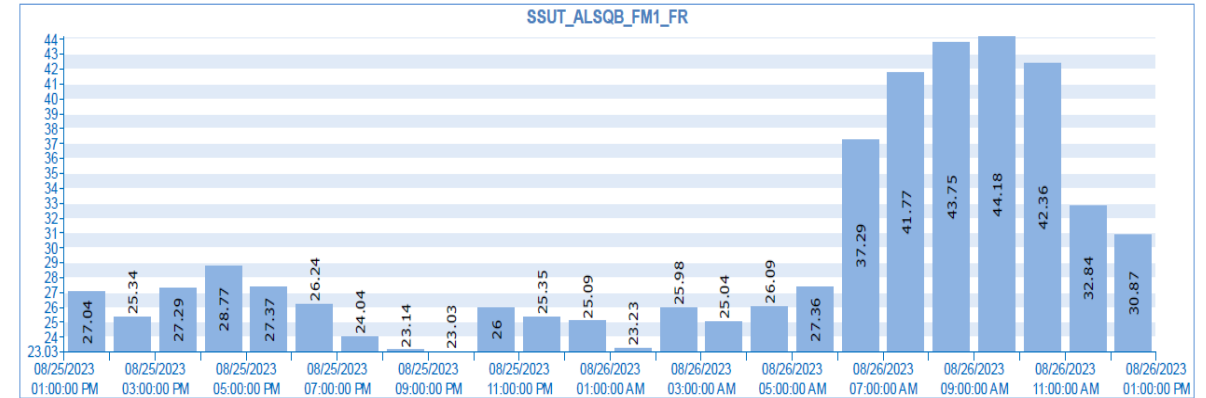
Time	SSUT_ALSQB_FM1	SSUT_ALSQB_FM2	SysMin	SysHour
25/08/2023 14:00:00	27.04	5.10	0.00	0.00
25/08/2023 15:00:00	26.43	32.02	0.00	1.00
25/08/2023 16:00:00	28.34	53.34	0.00	1.00
25/08/2023 17:00:00	29.79	143.23	0.00	1.00
25/08/2023 18:00:00	28.38	118.51	0.00	1.00
25/08/2023 19:00:00	27.32	101.45	0.00	1.00
25/08/2023 20:00:00	25.04	76.25	0.00	1.00
25/08/2023 21:00:00	24.21	122.38	0.00	1.00
25/08/2023 22:00:00	24.09	20.57	0.00	1.00
25/08/2023 23:00:00	27.06	71.06	0.00	1.00
26/08/2023 00:00:00	26.37	114.31	0.00	1.00
26/08/2023 01:00:00	26.12	68.85	0.00	0.00
26/08/2023 02:00:00	24.31	162.63	0.00	1.00
26/08/2023 03:00:00	27.04	171.20	0.00	1.00
26/08/2023 04:00:00	26.07	204.32	0.00	1.00
26/08/2023 05:00:00	27.10	257.80	0.00	1.00
26/08/2023 06:00:00	28.41	146.33	0.00	1.00
26/08/2023 07:00:00	38.29	76.33	0.00	1.00
26/08/2023 08:00:00	42.80	100.47	0.00	0.00
26/08/2023 09:00:00	44.81	161.97	0.00	0.00
26/08/2023 10:00:00	45.25	44.89	0.00	0.00
26/08/2023 11:00:00	43.38	11.29	0.00	0.00
26/08/2023 12:00:00	33.93	13.23	0.00	0.00
26/08/2023 13:00:00	31.93	10.19	0.00	0.00

SWSCADA Flow Meter Report(Daily) - ALSQB

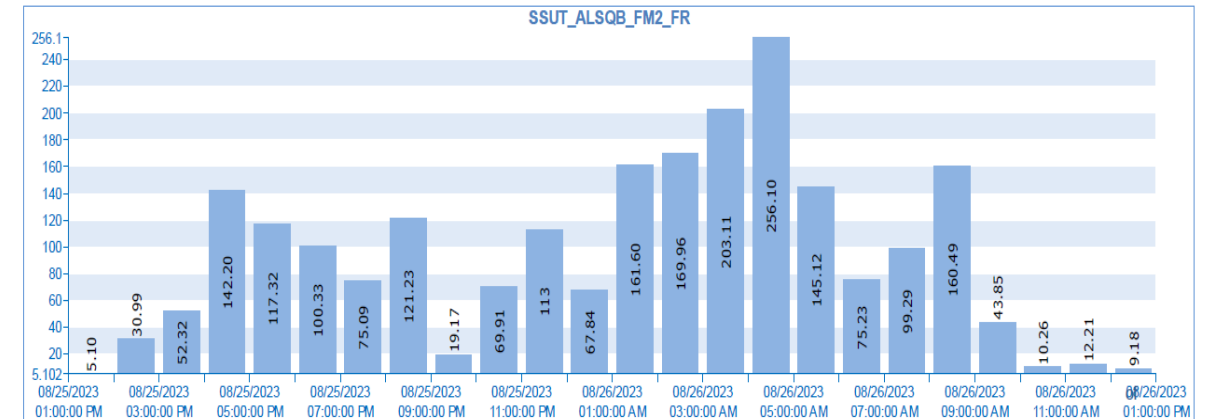
Report Period : 25/08/2023 12:59 PM To 26/08/2023 01:00 PM



HOURLY TOTAL (m3)



HOURLY TOTAL (m3)



Water Meter Management

QF were able to identify a leakage in one of the sub header lines on 5th August 2023 utilizing the High Alarm set for Al Shaqab Flow meter

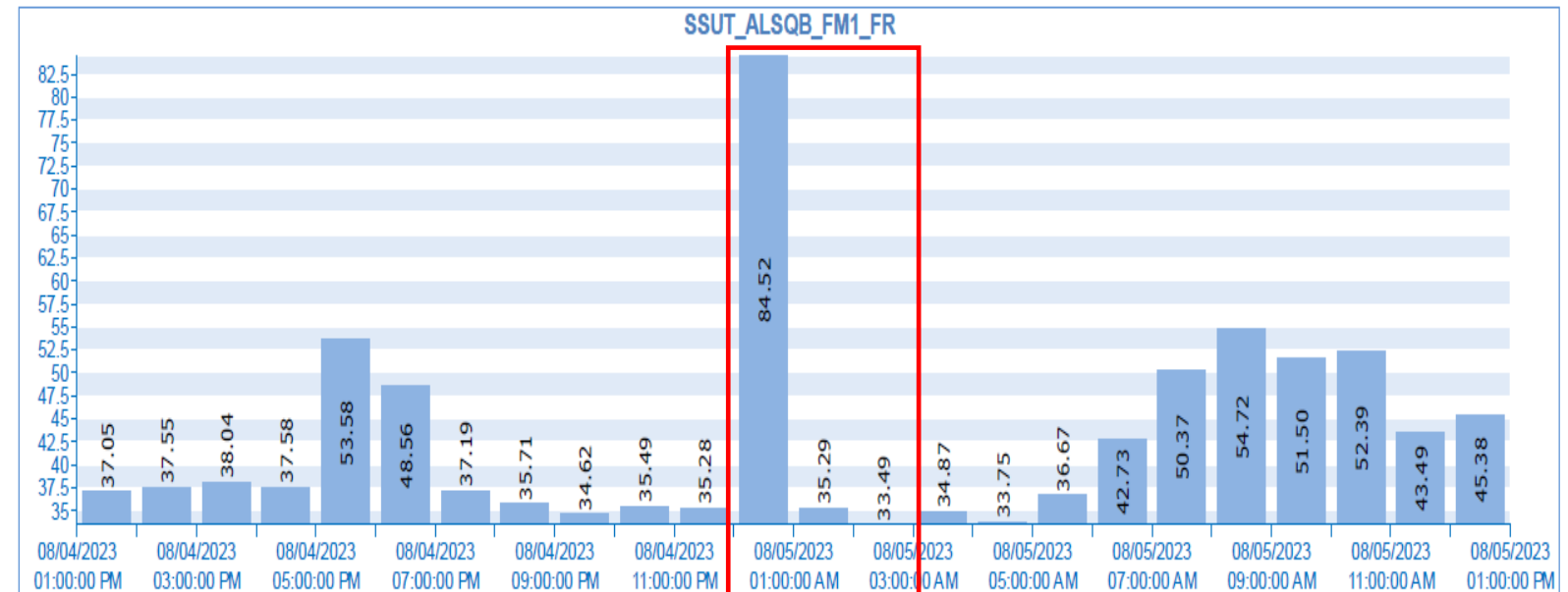
- Facilities water usage at night is less compared morning due to unoccupancy
- Average water usage at Al Shaqab facility is around 35 m³/Hr at night
- On the 5th August 2023 at night water usage peaked to 84 m³/hr due to a leakage in the sub header
- High flow alerted the remote operator on his cell phone, and local operators were able to bypass the line and avoid huge wastage and cooling water

SWSCADA Flow Meter Report(Daily) - ALSQB

Report Period : 04/08/2023 12:59 PM To 05/08/2023 01:00 PM

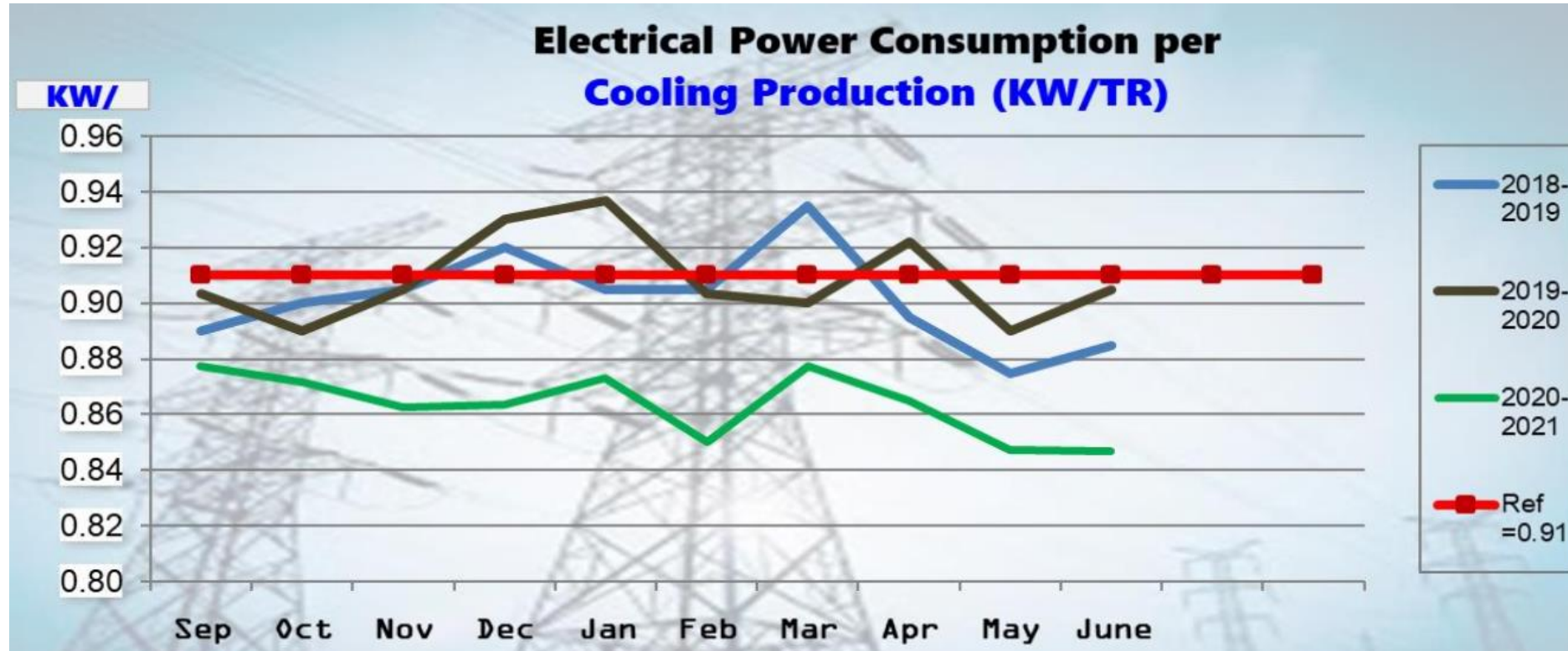


HOURLY TOTAL (m3)



Optimum Energy Utilization

Electrical Consumption is considerably reduced, and Chiller Plant efficiency has improved from previous years average from 0.91 kW/TR down to 0.86 KW/TR leading to 5.5 % cost reduction to QF



- Performance of the District Cooling Plants and Energy Transfer Stations are continuously monitored 24/7
- Real time diagnostics of all operating systems and equipment for higher reliability and lower operating costs

Planning and Scheduling

Scheduler is a calendar-based programming tool that allows a user to manipulate tag values. It can be used to create a sequence of automatically executed commands.

- The Time Scheduler is used to manage the lighting, heating and other sub systems in a building, providing benefits such as automated services
- Simple on/off commands, multi-state and multiple tag variations can be configured
- Scheduler allows exchange of data between control system devices related to the establishment and maintenance of dates and times at which specified output actions are to be taken
- Interoperability in this area permits the use of date and time schedules for starting and stopping equipment and changing control setpoints as well as other analog or binary parameters
- Scheduler provides different configuration and type of events. Schedule can be time based or condition based
- When the event condition or specified time is met, scheduler writes the user specified value to the attributes/tag name

Scheduler

CP1 SCADA Application - Scheduler LogOff wonderware 17/09/2023 21:22:38

Site-Wide Overview North Campus South Campus Summary Alarms Trend Scheduler Documents Systems Print

North Campus

- CP2-0002
- TMA-3121
- NSUT-0051
- CP3-0003
- CP6-0006
- QNCC-3001
- QSTP-2011
- RDC-2301
- Tech4-2020

South Campus

- CP1-0001
- ALSQB
- CP4-0004
- CMU-1171
- CMC-1181
- QFIS-1131
- SC-1211
- AWSAJ-1231
- FSH-1281
- MSH-1271
- NEUCP-1321
- OP-1234
- QNL-1151
- WGS-0000
- WCP-1371
- VCU-1241
- TAMUQ-1221
- CP7-0007
- SSC-1201
- HQ-1001
- CP5-0005
- GTU-1191
- SECP-0079
- QAE-1101
- QFJS
- AJCC

Scheduler Zone Time Period Holiday/Weekend Search

Schedules Events Calendar

Title	Mode	Schedule Time	Zone
AHU1029	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1029
AHU1001	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1001
AHU1051	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1051
AHU1058A	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1058A
AHU1058B	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1058B
AHU1117A	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1117A
AHU1117B	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1117B
AHU1169	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1169
AHU1191A	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1191A
AHU1191B	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1191B
AHU1197A	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1197A
AHU1197B	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1197B
AHU1217A	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1217A
AHU1217B	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU1217B
AHU2001	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2001
AHU2031	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2031
AHU2059	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2059
AHU2098	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2098
AHU2138	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2138
AHU2146A	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2146A
AHU2146B	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2146B
AHU2169A	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2169A
AHU2169B	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2169B
AHU2177	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2177
AHU2205A	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2205A
AHU2205B	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2205B
AHU2217	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU2217
AHU3001	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3001
AHU3012	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3012
AHU3012B	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3012B
AHU3013	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3013
AHU3032	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3032
AHU3043	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3043
AHU3047	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3047
AHU3061	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3061
AHU3065	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3065
AHU3065B	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3065B
AHU3085	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3085
AHU3076	ZoneBased	TimePeriod - TIME SCHEDULE-OCCU-...	AHU3076

OneTime Daily Weekly Event Holiday/Weekend

17/09/2023 21:19:00 MSH_UB_WtrSew_Stn3_SmpPmpDty... MSH_UB_Lift_Station-03_Water Sewage Duty Sump Pu... DSC 111 UNACK Running Running DSC MSH_UB1_Water MSHAOS Galaxy 000 00:00:00 000 00

17/09/2023 21:49:00 MSH_UB1_DX_3A_Alm... Dual Air Conditioning Unit - General Alarm DSC 251 UNACK RTN Normal Alarm DSC MSH_UB1_HVAC MSHAOS Galaxy 000 00:00:00 000 00

Edit Schedule Task

Title:

Mode: Zone Based Standard

Zone:

Schedule Time: Time Period Fix Time

Time:

Type: One Time Daily Weekly Holiday / Weekend

Exclude Holiday/Weekend

Override Condition

Attribute:

Criteria:

Value:

Attribute Definition					
	Period Name	StartTime	EndTime	SupplyAirTempSP (°C)	SupplyAirPressSP (Pa)
▶	Occupied	05:00	17:59	19	250
	Unoccupied-mmg	00:00	04:59	22	175
	Unoccupied-Night	18:00	23:59	22	175

Save Cancel

Run Hours + Statistics + CAFM Integration

AOC 2023 Integration with Computer Aided Facility Management (CAFM) enables Facility Managers to plan, execute and monitor all activities involved in reactive and planned preventative maintenance, asset management and operational facility services.

- Faceplate can be used for monitoring and controlling equipment
- It also shows statistical information like
 - Equipment Status
 - Equipment Total Run hours
 - Start Count
 - Last Run date
 - Trip Count

CP5GXY:CP5_CHW_TCHP04

CP5_CHW_TCHP04 Run Status: **Running**

CP5 CPNL 0006 Tertiary Chilled Water Supply Pump 04

Control & Status		Trend	Alarm
Control			
Status	Description	Command	
Auto	Auto Command	<input type="checkbox"/> Normal	
Normal	Manual Command	<input type="checkbox"/> Manual	
Normal	Start Command	<input type="checkbox"/> Start	
Normal	Stop Command	<input type="checkbox"/> Stop	
Normal	Reset Command	<input type="checkbox"/> Reset	
	Manual Speed SP	<input type="checkbox"/> 0.00 Hz	
	Maximum Speed SP	<input type="checkbox"/> 50.00 Hz	
	Minimum Speed SP	<input type="checkbox"/> 20.00 Hz	
Status			
Status	Description	Status	Description
Running	Status	No Fault	Fault Code
Auto	Auto/Manual Status	17.19 kW	Power
Remote	Local/Remote Status	50.00 Hz	Output Speed SP
No	Operation Interlock	45.09 Hz	Speed Feedback
No	Operation Interlock in Auto		
Statistics			
Status	Total Run Hrs	Start Count	Last Run DT
Running	26 23:07 <input type="button" value="Reset"/>	14	01/09/2023 00:09:32
			Trip Count
			0 <input type="button" value="Reset"/>

Run Hour statistics

CAFM Button

Raising Work Request straight from Equipment faceplate

During PPM users can reset the run count & trip count to analyze the running conditions of the equipment, if certain conditions reached user can raise work request to service the equipment by clicking CAFM button available on the faceplate.

The image shows a software interface for equipment monitoring and maintenance. On the left is the 'Equipment Faceplate' for 'CP5_CHW_TCHP04 CP5 CPNL 0006 Tertiary Chilled Water Supply Pump 04'. It displays a 'Run Status: Running' and a 'CAFM Button' (a crossed wrench and screwdriver icon). Below the status is a 'Trend' graph showing speed feedback over time, with a y-axis ranging from 0.000 to 50.100 Hz. At the bottom of the faceplate is a table of tags:

Tag Name	Description	Number	Server	Display Units	Original Units	Color	Minimum
CP5_CHW_TCHP04.RunSts	Run Status	1	CP1HST...	StoppedRun...	StoppedRun...	Blue	-1.000
CP5_CHW_TCHP04.OutSpeedSP	Output Speed Setpoint	2	CP1HST...	Hz	Hz	Red	49.900
CP5_CHW_TCHP04.Power	Power	3	CP1HST...	kW	kW	Orange	0.000
CP5_CHW_TCHP04.SpeedFbk	Speed Feedback	4	CP1HST...	Hz	Hz	Blue	0.000

On the right is the 'Archibus - Service Request' form. A red box highlights the 'Description' field, which contains the text: 'qfoperator1: CP5_CHW_TCHP04: Tertiary Chilled water supply pump 04 needs periodic service'. Below it, the 'Comment' field contains: 'it reached required run hours for maintenance -current run hours count - 26 days 23 hours'. The form also includes fields for Site ID, Building ID, Requested By, and other metadata. At the bottom right of the form are 'Submit' and 'Cancel' buttons.

Equipment Alarms

The Operator can easily configure the supervisory Alarms, acknowledge them and take immediate action

CP3GXY:CP3_AHU0001_SupAirTemp

CP3_AHU0001_SupAirTemp PV: 12.86 °C

CP3 AHU 0001 Duct Supply Air Temperature TIT-5002

Trend Alarm

Status	Description	Ack	Shelve
	High-High Alarm	<input type="button" value="Ack"/>	<input type="button" value="Shelve"/>
	High Alarm	<input type="button" value="Ack"/>	<input type="button" value="Shelve"/>
	Low Alarm	<input type="button" value="Ack"/>	<input type="button" value="Shelve"/>
	Low-Low Alarm	<input type="button" value="Ack"/>	<input type="button" value="Shelve"/>
	Communication Alarm	<input type="button" value="Ack"/>	<input type="button" value="Shelve"/>

Ack All Unshelve All Unshelve Current Hist A&E

Alarm Configuration

Description	Enable	Setpoint	Time Delay
High-High Alarm	<input checked="" type="checkbox"/>	28.00 °C	15.00 Sec
High Alarm	<input checked="" type="checkbox"/>	27.00 °C	
Low Alarm	<input checked="" type="checkbox"/>	12.26 °C	
Low-Low Alarm	<input checked="" type="checkbox"/>	10.00 °C	
Communication Alarm	<input checked="" type="checkbox"/>	15.00 Sec	

Save Cancel

Scaling

	Minimum	Maximum	
Operating Range	9.00 °C	29.00 °C	<input type="checkbox"/> Limit Alarm Setpoints
Engineering Unit Value	0.00 °C	100.00 °C	
Raw Value	0.00	100.00	

CP3GXY:CP3_AHU0001_CoolVlv

CP3_AHU0001_CoolVlv Position Feedback: 99.00 %

CP3 AHU 0001 Cooling Valve XV-0001

Control & Status Trend Alarm

Status	Description	Ack	Shelve
	Position Feedback Alarm	<input type="button" value="Ack"/>	<input type="button" value="Shelve"/>
	Fail to Open Alarm	<input type="button" value="Ack"/>	<input type="button" value="Shelve"/>
	Fail to Close Alarm	<input type="button" value="Ack"/>	<input type="button" value="Shelve"/>
	Communication Fail Alarm	<input type="button" value="Ack"/>	<input type="button" value="Shelve"/>

Ack All Unshelve All Unshelve Current Hist A&E

Alarm Configuration

Description	Enable	Time Delay
Position Feedback Alarm	<input checked="" type="checkbox"/>	0.00 Sec
Fail to Open Alarm	<input checked="" type="checkbox"/>	120.00 Sec
Fail to Close Alarm	<input checked="" type="checkbox"/>	120.00 Sec
Communication Fail Alarm	<input checked="" type="checkbox"/>	0.00 Sec

Save Cancel

Project Goals are Achieved

The implementation of a Unified Operation Platform by means of AOC 2023 is the corner stone for the transformation of Education City into a SMART City.

- Qatar Foundation has achieved 2 State of the Art Central Command Centers to Monitor and Control 45+ facilities at Education City.
- The achieved key goals are:
 - Reduction of Education City carbon footprint through optimum energy consumption
 - Reliable and redundant operation solution
 - Secure – AVEVA cyber security standards , QF OT firewall
 - Accessible from anywhere using InTouch Access Anywhere
 - Fully Documented System
 - Scalable Platform for future expansion
 - Easy operation & Easy to train operators
 - Operation excellence using better reports, alarm management, trends and CAFM integration
 - Energy consumptions controls and trend data availability



Future enhancements of the system

As future enhancement to the Unified Operating Platform QF is looking to implement

- Asset Performance Management
- Energy Management solutions
- Smart meter integration with AOC 2023
- Future expansion of SCADA to monitor & control of other facilities like QA Sidra, Education City Stadium, etc.



Reduction of Education City carbon footprint through optimum energy consumption

Challenge

- 12 sq km campus with 45+ buildings including educational, hospital, recreational, industrial, and sports facilities.
- Diverse makes and models of existing controls across facilities with inconsistency visualization, trending, and reporting interfaces.
- Difficulty to control and monitor all operations from centralized control rooms.

Solution

- Deployed AVEVA Operations Control to streamline process visibility and centralized control. Utilizing a high availability architecture design enabling operation from two command centers interconnected throughout all facilities.

Results

- Centralized control and independent monitoring & Control for over 45+ facilities
- Better visibility to information has led to 5.5 % reduction in energy consumption, optimum energy utilization, and enabled more reliable operations performance
- Corner stone for smart city transformation at QATAR Foundation Education City through a unified operation platform
- Streamlined operator training due to standardized design and function

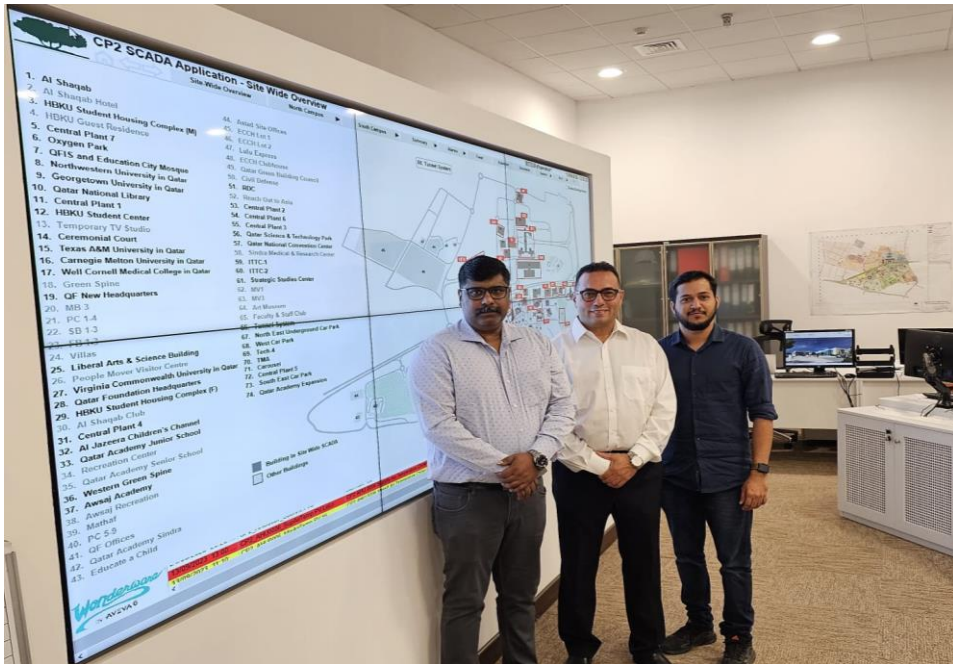


“AVEVA Operations Platform aligns Education City with our leadership's vision to transform it into a Digital Smart City, controlled from a centralized command center to attain optimum operability and to provide necessary information for decision making for our prestigious facilities to reduce their carbon footprint and O&M costs.”

Georgios Sichanis, SPM, ASTAD

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Take Away Quote

“Alone we can do so little, TOGETHER WE CAN DO SO MUCH.” By Helen Keller

